WHAT IS CLAIMED AS NEW AND IS DESIRED TO BE SECURED BY

LETTERS PATENT OF THE UNITED STATES IS:

1. An image reading-out apparatus for exposing and scanning an original document to read out an image on said

5 original document and thereby obtaining image data, comprising:

a background level detecting circuit configured to detect said background level of said original document from said image data;

10 an analog-to-digital converter configured to remove an influence due to the color of said background on said original document from said image data and configured to perform the analog-to-digital conversion of said image data in accordance with said detected background level; and

15 a black-shading compensation circuit configured to perform black-shading compensation of said image data after said analog-to-digital conversion,

wherein said black-shading compensation circuit comprises:

20 plural black level values calculating circuits configured to respectively obtain, per each one line, black level values employed for said black-shading compensation from said image data by use of respective different calculation members;

25 a selection circuit configured to select and output

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one black level value among plural sorts of the black level

values outputted by said plural black level values

calculating circuits; and

a subtracter configured to subtract said selected

5   black level value from said image data after performing said

analog-to-digital conversion and said black-shading

compensation.

2. The image reading-out apparatus as defined in claim 1,

10   further comprising:

a control member configured to perform the selection

for said image data by use of said selection circuit in

accordance with the sorts of the processing performed at a

stage subsequent to that of said black-shading compensation

15   circuit.

3. The image reading-out apparatus as defined in claim 2,

wherein one of said plural black level values

calculating circuits is a first calculation circuit which is

20   configured to calculate said black level value on the basis

of the image data per one line inputted this time and the

image data per one or plural lines inputted until last time;

and

wherein another one of said plural black level values

25   calculating circuits is a second calculation circuit which is

configured to calculate said black level value only on the basis of the image data per one line inputted this time.

4. The image reading-out apparatus as defined in claim 3,
wherein the sorts of processings performed at the stage subsequent to that of said black-shading compensation circuit include first processing and second processing;

wherein the first processing is a processing of amplifying the influence exerted by the noise on said image data to a larger extent than the second processing;

wherein the second processing is a processing of being less apt to be affected by said noise than the first processing;

wherein, in the case of performing said first processing, said control member causes the black level from said first calculation circuit to be outputted from said selection circuit; and

wherein, in the case of performing said second processing, said control member causes the black level from said second calculation circuit to be outputted from said selection circuit.

5. The image reading-out apparatus as defined in claim 4,
wherein said first processing is an MTF compensation.

6. The image reading-out apparatus as defined in claim 4,

wherein said second processing is a smoothing

processing.

5   7. The image reading-out apparatus as defined in claim 5,

wherein said second processing is a smoothing

processing.

8. A copying machine comprising:

10   an image reading-out apparatus for exposing and

scanning an original document to read out an image on the

original document and thereby obtaining image data; and

an image forming apparatus for forming an image on

the basis of the image data obtained by said image reading-

15   out apparatus which comprises:

a background level detecting circuit configured to

detect said background level of said original document

from said image data;

an analog-to-digital converter configured to remove an

20   influence due to the color of said background on said

original document from said image data and configured to

perform the analog-to-digital conversion of said image data

in accordance with said detected background level; and

a black-shading compensation circuit configured to

25   perform black-shading compensation of said image data after

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said analog-to-digital conversion,

wherein said black-shading compensation circuit comprises:

plural black level values calculating circuits

5   configured to respectively obtain, per each one line, black level values employed for said black-shading compensation from said image data by use of respective different calculation members;

a selection circuit configured to select and output

10 one black level value among plural sorts of the black level values outputted by said plural black level values calculating circuits; and

a subtracter configured to subtract said selected black level value from said image data after performing said

15 analog-to-digital conversion and said black-shading compensation.

9. A facsimile device comprising:

an image reading-out apparatus for exposing and

20 scanning an original document to read out an image on the original document and thereby obtaining image data;

a transmitting/receiving apparatus for transmitting the image data obtained by said image reading-out apparatus to a network and receiving the image data from said network;

25 and

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an image forming apparatus for forming the image on
the basis of the image data received by said transmitting/
receiving apparatus,

wherein said image reading-out apparatus comprises:

5   a background level detecting circuit configured to
detect said background level of said original document
from said image data;

an analog-to-digital converter configured to remove an
influence due to the color of said background on said
10   original document from said image data and configured to
perform the analog-to-digital conversion of said image data
in accordance with said detected background level; and

a black-shading compensation circuit configured to
perform black-shading compensation of said image data after
15   said analog-to-digital conversion,

wherein said black-shading compensation circuit
comprises:

plural black level values calculating circuits
configured to respectively obtain, per each one line, black
20   level values employed for said black-shading compensation
from said image data by use of respective different
calculation members;

a selection circuit configured to select and output
one black level value among plural sorts of the black level
25   values outputted by said plural black level values

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calculating circuits; and

a subtracter configured to subtract said selected

black level value from said image data after performing said

analog-to-digital conversion and said black-shading

5   compensation.

20. An image reading-out apparatus for exposing and

scanning an original document to read out an image on said

original document and thereby obtaining image data,

10   comprising:

background level detecting means for detecting

said background level of said original document from said

image data;

analog-to-digital conversion means for removing an

15   influence due to the color of said background on said

original document from said image data and performing the

analog-to-digital conversion of said image data in accordance

with said detected background level; and

black-shading compensation means for performing black-

20   shading compensation of said image data after said analog-to-

digital conversion,

wherein said black-shading compensation means

comprises:

plural black level values calculating means for

25   respectively obtaining, per each one line, black level values

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employed for said black-shading compensation from said image

data by use of respective different calculation members;

selection means for selecting and outputting one black

level value among plural sorts of black level values

5   outputted by said plural black level values calculating

means; and

subtraction means for subtracting said selected black

level value from said image data after said analog-to-digital

conversion and performing said black-shading compensation.

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11. The image reading-out apparatus as defined in claim

10, further comprising control means for performing the

selection for said image data by use of said selection means

in accordance with the sorts of the processing performed at a

15   stage subsequent to that of said black-shading compensation

means.

12. The image reading-out apparatus as defined in claim

11,

20   wherein one of said plural black level values

calculating means is a first calculation means for

calculating said black level value on the basis of the image

data per one line inputted this time and the image data per

one or plural lines inputted until last time; and

25   wherein another one of said plural black level values

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calculating means is a second calculation means for

calculating said black level value only on the basis of the

image data per one line inputted this time.

5   13. The image reading-out apparatus as defined in claim

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        wherein the sorts of processings performed at the

stage subsequent to that of said black-shading compensation

means include first processing and second processing;

10   wherein the first processing is a processing of

amplifying the influence exerted by the noise on said image

data to a larger extent than the second processing;

        wherein the second processing is a processing of being

less apt to be affected by said noise than the first

15 processing;

        wherein, in the case of performing said first

processing, said control means causes the black level from

said first calculation means to be outputted from said

selection means; and

20   wherein, in the case of performing said second

processing, said control means causes the black level from

said second calculation means to be outputted from said

selection means.

25   14. The image reading-out apparatus as defined in claim

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Wherein said first processing is an MTF compensation.

15. The image reading-out apparatus as defined in claim

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wherein said second processing is a smoothing

processing.

16. The image reading-out apparatus as defined in claim

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wherein said second processing is a smoothing

processing.

17. A copying machine comprising:

an image reading-out apparatus for exposing and scanning

an original document to read out an image on the original

document and thereby obtaining image data: and

an image forming apparatus for forming an image on a

basis of the image data obtained by said image reading-out

apparatus which comprises:

background level detecting means for detecting

said background level of said original document from said

image data;

analog-to-digital conversion means for removing an

influence due to the color of said background on said

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original document from said image data and performing the analog-to-digital conversion of said image data in accordance with said detected background level; and

black-shading compensation means for performing black-shading compensation of said image data after said analog-to-digital conversion,

wherein said black-shading compensation means comprises:

plural black level values calculating means for respectively obtaining, per each one line, black level values employed for said black-shading compensation from said image data by use of respective different calculation members;

selection means for selecting and outputting one black level value among plural sorts of black level values outputted by said plural black level values calculating means; and

subtraction means for subtracting said selected black level value from said image data after said analog-to-digital conversion and performing said black-shading compensation.

18. A facsimile device comprising:

an image reading-out apparatus for exposing and scanning an original document to read out an image on the original document and thereby obtaining image data:

a transmitting/receiving apparatus for transmitting

the image data obtained by said image reading-out apparatus

to a network and receiving the image data from said network;

and

an image forming apparatus for forming the image on a

5   basis of the image data received by said

transmitting/receiving apparatus,

wherein said image reading-out apparatus comprises:

background level detecting means for detecting

said background level of said original document from said

10   image data;

analog-to-digital conversion means for removing an

influence due to the color of said background on said

original document from said image data and performing the

analog-to-digital conversion of said image data in accordance

15   with said detected background level; and

black-shading compensation means for performing black-

shading compensation of said image data after said analog-to-

digital conversion,

wherein said black-shading compensation means

20   comprises:

plural black level values calculating means for

respectively obtaining, per each one line, black level values

employed for said black-shading compensation from said image

data by use of respective different calculation members;

25   selection means for selecting and outputting one black

level value among plural sorts of black level values

outputted by said plural black level values calculating

means; and

subtraction means for subtracting said selected black

5   level value from said image data after said analog-to-digital

conversion and performing said black-shading compensation.

19. A method of reading out an image on an original

document by exposing and scanning said original document and

10   thereby obtaining image data comprising:

detecting the background level of said original

document from said image data;

removing an influence due to the color of the

background on said original document from said image data;

15   performing the analog-to-digital conversion of said

image data in accordance with said detected background level;

and

performing black-shading compensation of said image

data after said analog-to-digital conversion.

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20. The method of reading out the image on the original

document as defined in claim 19,

wherein said black-shading compensation comprises;

respectively obtaining, per each one line, plural

25   black level values employed for said black-shading

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compensation from said image data by use of respective

different calculation members;

selecting and outputting one black level value among

plural sorts of black level values outputted by the plural

5   black level values calculating members; and

subtracting said selected black level value from said

image data after said analog-to-digital conversion and

performing said black-shading compensarion.

10   21. The method of reading out the image on the original

document as defined in claim 19, further comprising:

performing the selection for said image data by use of

the selection circuit in accordance with the sorts of the

processing performed at the stage subsequent to that of said

15   black-shading compensation member.

22. The method of reading out the image on the original

document as defined in claim 20, further comprising:

performing the selection for said image data by use of

20   the selection circuit in accordance with the sorts of the

processing performed at the stage subsequent to that of said

black-shading compensation member.

23. The method of reading out the image on the original

25   document as defined in claim 21,

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wherein one of said plural black level values

calculating steps is the first calculation step of

calculating said black level value on the basis of the image

data per one line inputted this time and the image data per

5   one or plural lines inputted until last time; and

wherein another one of said plural black level values

calculating steps is the second calculation step of

calculating said black level value only on the basis of the

image data per one line inputted this time.

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24. The method of reading out the image on the original

document as defined in claim 22,

wherein one of said plural black level values

calculating steps is a first calculation step of calculating

15   said black level value on the basis of the image data per one

line inputted this time and the image data per one or plural

lines inputted until last time; and

wherein another one of said plural black level values

calculating steps is a second calculation step of calculating

20   said black level value only on the basis of the image data

per one line inputted this time.

25. The method of reading out the image on the original

document as defined on claim 23,

25   wherein the steps of processings performed at the

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stage subsequent to that of said black-shading compensation

member include first processing and second processing;

wherein the first processing is a processing of

amplifying the influence exerted by the noise on said image

5   data to a larger extent than the second processing;

wherein the second processing is a processing being

less apt to be affected by said noise than the first

processing;

wherein, in the case of performing said first

10   processing, said control member causes the black level from

said first calculation member to be outputted from said

selection member; and

wherein, in the case of performing said second

processing, said control member causes the black level from

15   said second calculation member to be outputted from said

selection member.

26. The method of reading out the image on the original

document as defined on claim 24,

20   wherein the steps of processings performed at a stage

subsequent to that of said black-shading compensation member

include first processing and second processing;

wherein the first processing is a processing of

amplifying the influence exerted by the noise on said image

25   data to a larger extent than the second processing;

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wherein the second processing is a processing being less apt to be affected by said noise than the first processing;

wherein, in the case of performing said first processing, said control member causes the black level from said first calculation member to be outputted from said selection member; and

wherein, in the case of performing said second processing, said control member causes the black level from said second calculation member to be outputted from said selection member.

27. The method of reading out the image on the original document as defined in claim 25,

    wherein said first processing is an MTF compensation.

28. The method of reading out the image on the original document as defined in claim 26,

    wherein said first processing is an MTF compensation.

29. The method of reading out the image on the original document as defined in claim 25,

    wherein said second processing is a smoothing processing.

30. The method of reading out the image on the original document as defined in claim 26,

wherein said second processing is a smoothing processing.

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31. The method of reading out the image on the original document as defined in claim 27,

wherein said second processing is a smoothing processing.

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32. The method of reading out the image on the original document as defined in claim 28,

wherein said second processing is a smoothing processing.

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33. A method of copying an image on an original document by exposing and scanning said original document and thereby obtaining image data, comprising:

detecting the background level of said original
20   document from said image data;

removing an influence due to the color of the background on said original document from said image data;

performing the analog-to-digital conversion of said image data in accordance with said detected background level;
25   and

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performing black-shading compensation of said image data after said analog-to-digital conversion; and

forming an image on the basis of the image data.

5   34. A method of exchanging an image data by use of a facsimile device in which an image on an original document is read by exposing and scanning said original document and thereby obtaining image data, comprising:

detecting the background level of said original

10   document from said image data;

removing an influence due to the color of the background on said original document from said image data;

performing the analog-to-digital conversion of said image data in accordance with said detected background level;

15   performing black-shading compensation of said image data after said analog-to-digital conversion;

transmitting the image data obtained by said image reading-out apparatus to a network and receiving the image data from said network; and

20   forming the image on the basis of the received image data.